

ENCO LABORATORIES  
 REPORT # : OR5577  
 DATE REPORTED: March 8, 1999  
 PROJECT NAME : Lake Toho Draw Down

PAGE 6 OF 9

# RESULTS OF ANALYSIS

## EPA METHOD 8081 - ORGANOCHLORINE PESTICIDES

	<u>SITE #5</u>	<u>SITE #6</u>	<u>Units</u>
alpha-BHC	2.6 U	2.4 U	µg/Kg
beta-BHC	2.6 U	2.4 U	µg/Kg
gamma-BHC (Lindane)	2.5 U	2.4 U	µg/Kg
heptachlor	2.6 U	2.4 U	µg/Kg
delta-BHC	2.6 U	2.4 U	µg/Kg
dieldrin	2.5 U	2.4 U	µg/Kg
gamma-hexachlor Epoxide	2.5 U	2.4 U	µg/Kg
gamma-chlordane gamma	2.6 U	2.4 U	µg/Kg
gamma-chlordane alpha	2.5 U	2.4 U	µg/Kg
endosulfan I	2.6 U	2.4 U	µg/Kg
1,4'-DDE	2.6 U	2.4 U	µg/Kg
dieldrin	2.6 U	2.4 U	µg/Kg
endrin	2.6 U	2.4 U	µg/Kg
1,4'-DDD	2.5 U	2.4 U	µg/Kg
endosulfan II	2.6 U	2.4 U	µg/Kg
1,4'-DDT	2.6 U	2.4 U	µg/Kg
endrin aldehyde	2.5 U	2.4 U	µg/Kg
endosulfan sulfate	2.5 U	2.4 U	µg/Kg
methoxychlor	15 U	14 U	µg/Kg
endrin Ketone	3.5 U	3.3 U	µg/Kg
gamma-chlordane (Total)	50 U	48 U	µg/Kg
oxyphenol	100 U	95 U	µg/Kg
endrin	5.0 U	4.7 U	µg/Kg
mirex	5.0 U	4.7 U	µg/Kg
<u> surrogate:</u>	<u>% RECOV</u>	<u>% RECOV</u>	<u>LIMITS</u>
4,5,6-TCMX	126	120	30-150
TC	132	112	37-128
ate Extracted	03/01/99	03/01/99	
ate Analyzed	03/03/99	03/03/99	

NOTE: Analyte values are reported on a dry weight basis.

- Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

<u>MISCELLANEOUS</u>	<u>METHOD</u>	<u>SITE #5</u>	<u>SITE #6</u>	<u>Units</u>
Percent Solids	SM2540G	66	70	%
ate Analyzed		03/05/99	03/05/99	

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RESULTS OF ANALYSIS

EPA METHOD 8081 -

ORGANOCHLORINE PESTICIDES

	<u>LAB BLANK</u>	<u>Units</u>
alpha-BHC	1.7 U	µg/Kg
beta-BHC	1.7 U	µg/Kg
gamma-BHC (Lindane)	1.7 U	µg/Kg
heptachlor	1.7 U	µg/Kg
delta-BHC	1.7 U	µg/Kg
dieldrin	1.7 U	µg/Kg
gamma-hexachlor Epoxide	1.7 U	µg/Kg
gamma-hexachlor gamma	1.7 U	µg/Kg
gamma-hexachlor alpha	1.7 U	µg/Kg
hexachlor sulfan I	1.7 U	µg/Kg
1,4'-DDE	1.7 U	µg/Kg
dieldrin	1.7 U	µg/Kg
dieldrin	1.7 U	µg/Kg
1,4'-DDD	1.7 U	µg/Kg
hexachlor sulfan II	1.7 U	µg/Kg
1,4'-DDT	1.7 U	µg/Kg
dieldrin aldehyde	1.7 U	µg/Kg
hexachlor sulfan sulfate	1.7 U	µg/Kg
gamma-hexachlor	10 U	µg/Kg
dieldrin Ketone	2.3 U	µg/Kg
gamma-hexachlor (Total)	33 U	µg/Kg
hexachlor	67 U	µg/Kg
dieldrin	3.3 U	µg/Kg
hexachlor	3.3 U	µg/Kg

Surrogate:

	<u>% RECOV</u>	<u>LIMITS</u>
4,5,6-TCMX	108	30-150
1,2,4-TCMX	94	37-128
1,2,4-TCMX	03/01/99	
1,2,4-TCMX	03/03/99	

\* Compound was analyzed for but not detected to the level shown.



QSRF #

## ENVIRONMENTAL CONSERVATION LABORATORIES

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Jacksonville, Florida 32216-6069 Orlando, Florida 32824  
Ph. (904) 296-3007 • Fax (904) 296-6210 Ph. (407) 826-5314 • Fax (407) 850-6945  
ENCO CompQAP No.: 960038G/0

## CHAIN OF CUSTODY RE

PROJECT REFERENCE		PROJECT NO.	P.O. NUMBER	MATRIX TYPE		REQUIRED ANALYSIS		PAGE
PROJECT LOC. (State)	SAMPLER(S) NAME	PHONE	FAX	CLIENT PROJECT MANAGER				
CLIENT NAME								
CLIENT ADDRESS (CITY, STATE, ZIP)								
FL	M. Andrews							
George & Fish Commission								
CLIENT ADDRESS (CITY, STATE, ZIP)								
SAMPLE		STATION		DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION
1	1	2/24/99	0945	X				Site 1
2	2	"	1016	X				Site 2
3	3	"	1037	X				Site 3
4	4	"	1115	X				Site 4
5	5	"	1144	X				Site 5
6	6	"	1220	X				Site 6
7								
8								
9								
10								
11								
12								
13								
14								
SAMPLE KIT PREPARED BY:		DATE	TIME	RELINQUISHED BY: (SIGNATURE)		DATE	TIME	RECEIVED BY: (SIGNATURE)
DUACKSONVILLE		2/24/99	1304	P. Armstrong		2/24/99	1:50	
RELINQUISHED BY: (SIGNATURE)		DATE	TIME	RECEIVED BY: (SIGNATURE)		DATE	TIME	RELINQUISHED BY: (SIGNATURE)
RELINQUISHED BY: (SIGNATURE)		DATE	TIME	RECEIVED BY: (SIGNATURE)		DATE	TIME	RELINQUISHED BY: (SIGNATURE)
RECEIVED FOR LABORATORY BY: (SIGNATURE)		DATE	TIME	CUSTODY INTACT		ENCO LOG NO.	REMARKS	
Kim Curry		2/24/99	1304	YES		25577		
Jacksonville		Orlando						

STATION	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION	MATRIX TYPE	REQUIRED ANALYSIS	PAGE
1	2/24/99	0945	X		Site 1	AIR		
2	"	1016	X		Site 2	SLUDGE		
3	"	1037	X		Site 3	NONAQUEOUS LIQUID (not solvent, etc.)		
4	"	1115	X		Site 4	SOIL/SOLID SEDIMENT		
5	"	1144	X		Site 5	DRINKING WATER		
6	"	1220	X		Site 6	WASTEWATER		
7						GROUND WATER		
8						SURFACE WATER		
9						OTHER		
10						OTHER		
11						OTHER		
12						OTHER		
13						OTHER		
14						OTHER		

STATION	DATE	TIME	GRAB	COMP	SAMPLE IDENTIFICATION	REMARKS
1	2/24/99	0945	X		Site 1	#5
2	"	1016	X		Site 2	#3
3	"	1037	X		Site 3	#6
4	"	1115	X		Site 4	#4
5	"	1144	X		Site 5	#2
6	"	1220	X		Site 6	#1

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1	2/24/99					

ENCO LABORATORIES  
 REPORT # : OR5577  
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 PROJECT NAME : Lake Toho Draw Down

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QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY MS/MSD/LCS</u>	<u>ACCEPT LIMITS</u>	<u>% RPD MS/MSD</u>	<u>ACCEPT LIMITS</u>
<u>PA Method 8081 (SITE #1, SITE #2, SITE #3, SITE #4)</u>				
gamma-BHC (Lindane)	130/120/ 90	44-105	8	40
heptachlor	130/130/ 75	58-109	<1	17
ldrin	100/ 90/ 60	35-103	10	51
ieldrin	52/ 60/ 60	54-139	14	35
ndrin	140/140/ 55	57-123	<1	26
-DDT	130/130/ 50	11-153	<1	25
<u>PA Method 8081 (SITE #5, SITE #6)</u>				
gamma-BHC (Lindane)	130/120/ 75	44-105	8	40
heptachlor	130/130/ 60	58-109	<1	17
ldrin	100/ 90/ 55	35-103	10	51
ieldrin	52/ 60/ 60	54-139	14	35
ndrin	140/140/ 50	57-123	<1	26
4'-DDT	130/130/ 65	11-153	<1	25

Environmental Conservation Laboratories Comprehensive QA Plan #960038

- = Less Than
- = Matrix Spike
- = Matrix Spike Duplicate
- = Laboratory Control Standard
- = Relative Percent Difference

This report shall not be reproduced except in full, without the written approval of the laboratory. Results for these procedures apply only to the samples as submitted.

## APPENDIX III

### FINAL ENVIRONMENTAL IMPACT STATEMENT COMMENTS AND RESPONSES



# United States Department of the Interior

## OFFICE OF THE SECRETARY

### OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE

Richard B. Russell Federal Building

75 Spring Street, S.W.

Atlanta, Georgia 30303

June 7, 1999

ER-99/321

Hanley K. Smith, Acting Chief,  
Planning Division  
Jacksonville District  
U. S. Army Corps of Engineers  
P. O. Box 4970  
Jacksonville, FL 32232-0019

Dear Mr. Smith:

The Department of the Interior has reviewed the draft Environmental Impact Statement for the Alligator Lake Chain and Lake Gentry Extreme Drawdown and Habitat Enhancement Project, Oseoloa County, FL, as requested.

**Page 10, Section 3:06; Groundwater**

The U. S. Geological Survey (USGS) is incorrectly referred to in the DEIS as the U. S. Geological Service.

① **Page 17, Section 4:09; Hazardous and Toxic Waste**

It is stated in the DEIS that . . . "since there is no evidence that Lake Tohopekaliga sediments are contaminated, it is reasonable to infer that the sediments in the Alligator Chain of Lakes (this study) are also uncontaminated." The only way to ascertain the accuracy of this statement is to sample and analyze the bottom-sediment chemistry of the lakes. It is likely that contamination does exist in the lakes because there have been problems with sewage treatment systems in some of the nearby communities.

Thank you for the opportunity to review and comment on the draft EIS.

Sincerely,

James H. Lee  
Regional Environmental Officer

RESPONSES TO COMMENTS FROM THE UNITED STATES  
DEPARTMENT OF THE INTERIOR  
OFFICE OF ENVIRONMENTAL POLICY AND COMPLIANCE  
RICHARD B. RUSSELL FEDERAL BLDG.  
75 SPRING STREET, S.W.  
ATLANTA, GA 30303

COMMENT: (1) It is stated in the DEIS that..."since there is no evidence that Lake Tohopekaliga sediments are contaminated, it is reasonable to infer that the sediments in the Alligator Chain of Lakes are also uncontaminated." The only way to ascertain the accuracy of this statement is to sample and analyze the bottom sediment chemistry of the lakes. It is likely that contamination does exist in the lakes because there have been problems with sewage treatment systems in some of the nearby communities.

RESPONSE: As stated in section 4.09 of the DEIS, The Florida Game and Freshwater Fish Commission has been conducting tests on these sediments, and analysis of the samples indicates that heavy metal contaminants are not present in levels that exceed U.S. Environmental Protection Agency (EPA) Region IV Sediment Screening Criteria for hazardous waste sites, or Florida Department of Environmental Protection (FDEP) Soil and Sediment Cleanup Goals Criteria. Therefore, it has been determined that excavation and placement of these materials should not cause degradation of water quality. A copy of these results is available in Appendix III of the FEIS. The referenced nearby sewage treatment system is addressed in section 3.05 of the FEIS; this is a water quality issue rather than hazardous and toxic waste, and has been remedied. Through an enforcement action by FDEP, the sewer lines have been replaced and no longer allow discharge of effluent into the lake. Also, the recreational park is under court order to upgrade or replace the water and sewage treatment plant.



LAW OFFICES  
**FISHBACK, DOMINICK, BENNETT, STEPTER,  
ARDAMAN, AHLERS & BONUS**

170 EAST WASHINGTON STREET  
**ORLANDO, FLORIDA 32801-2397**

G. BEN FISHBACK (1893-1983)

MARK F. AHLERS  
A. KURT ARDAMAN  
ZACHARY J. BANCROFT  
JOHN. F. BENNETT  
PHILIP F. BONUS  
JULIAN K. DOMINICK  
KATHRYN S. GRUBER  
LIONEL E. RUBIO  
CHARLES R. STEPTER, JR.

TELEPHONE (407) 425-2786

FAX (407) 425-2863

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May 14, 1999

Christine Bauer  
U. S. Army Corps of Engineers  
Planning Division  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

**Re: DRAFT - ENVIRONMENTAL IMPACT STATEMENT - MARCH 1999  
ALLIGATOR CHAIN AND LAKE GENTRY EXTREME DRAWDOWN AND  
HABITAT ENVIRONMENT PROJECT, OSCEOLA COUNTY, FLORIDA  
H.A. Smith, Jr., Trust; Gary & Se'Belle Dymmek; Se'Belle Smith Dymmek;  
Dosia Mae Smith Jimenez & Miranda Rose Smith Bailey and Se'Belle Smith  
Dymmek, Individually - Our File No. S138-14646**

Dear Ms. Bauer:

I represent H.A. Smith, Jr., Trust; Gary & Se'Belle Dymmek; Se'Belle Smith Dymmek; Dosia Mae Smith Jimenez & Miranda Rose Smith Bailey and Se'Belle Smith Dymmek, individually with respect to their properties located adjacent to and in the proximity to the Alligator chain of lakes, including , Alligator Lake, Lake Gentry and Brick Lake which would be affected by the proposed drawdown project.

My clients still object to the proposed project even though the lake level elevation during drawdown is proposed to be higher than originally sought by the requesting agencies. The bases for my clients' objections are set forth in the enclosed letter dated May 21, 1997 to the Southwest Florida Water Management District, the substantive concerns of which still apply. Additionally, the project does not guarantee that a weir to hold Brick Lake levels up during the proposed project would be constructed and operating.

Very truly yours,

A. Kurt Ardaman

AKA:mac  
Enclosure

c: Se'Belle Smith Dymmek (w/encl.-by facsimile 847-8477)

**FISHBACK, DOMINICK, BENNETT, STEPTER,  
ARDAMAN, AHLERS & BONUS**

170 EAST WASHINGTON STREET  
**ORLANDO, FLORIDA 32801-2397**

G. BEN FISHBACK (1893-1983)

MARK F. AHLERS  
A. KURT ARDAMAN  
JOHN F. BENNETT  
PHILIP F. BONUS  
JOHN M. CACCIATORE  
JULIAN K. DOMINICK  
MICHAEL T. SHERIDAN  
CHARLES R. STEPTER, JR.

TELEPHONE (407) 425-2786  
FAX (407) 425-2863

May 21, 1997

Mr. Jim Carnes  
South Florida Water Management District  
Lower West Coast Division  
3301 Gun Club Road  
P.O. Box 24680  
West Palm Beach, Florida 33416 - 4680

Re: Herbert A. Smith, Jr., Trust - Alligator Lake Chain & Lake Gentry draw down  
Our File No.: S138-14645  
Gary and Se'Belle Dymmek - Alligator Lake Chain & Lake Gentry draw down  
Our File No.: D304 - 14669  
Se' Belle Smith Dymmek - Alligator Lake Chain & Lake Gentry draw down  
Our File No.: D258 - 14667  
Se' Belle Smith Dymmek, Dosia Mae Smith Jimenez, and  
Miranda Rose Smith Bailey  
Our File No.: S45 - 14668

Dear Mr. Carnes:

Please be advised that I represent the following property owners: H.A. Smith, Jr., Trust; Gary and Se' Belle Dymmek; Se' Belle Smith Dymmek, Dosia Mae Smith Jimenez and Miranda Rose Smith Bailey; and Se' Belle Smith Dymmek individually. My client own property on or in immediate proximity to the Alligator Chain of Lakes, Lake Gentry and Brick Lake, collectively consisting of a very substantial trust of land in this area, the great majority of which is and has for many decades has been in active Citrus Production and use for livestock.

My clients currently rely, and have relied for decades, on the Alligator Lake Chain, Lake Gentry and Brick Lake for protection of their groves and agricultural activities and as a fundamental resource and right essential to their groves and agricultural operations.

The above listed water bodies serve a myriad of functions with respect to the groves and agricultural activities, some of which include:

1. A source of heat to protect the groves and agricultural operation from freezes;
2. A source of water for irrigation of the groves and agricultural operations;
3. A protective barrier which contains livestock on the property abutting the water

bodies and which inhibits trespassers;

4. A source for maintaining ground water conditions at protective and productive levels.

The proposed project to draw down the water levels in the Alligator Chain of Lakes and Lake Gentry would cause many detrimental effects, some of which are listed below:

1. A loss of water for irrigation of the groves and watering of the livestock.
2. Lowering of ground water, requiring greater irrigation needs and increasing vulnerability of the groves to freezes and other adverse affects.
3. Increased liability to land owners adjacent to the water bodies do to trespass concerns.
4. Lowering of water levels in other lakes such as Pearl Lake and Brick Lake.

Further, the Alligator Lake Chain and Lake Gentry 1998 Habitat Enhancement Project dated May 1997 indicates that there has been insufficient evaluation of the impact of the proposed project and a failure to provide protective or curative measures for the adverse consequences that would be caused by the project.

Except for a cursory consideration of possibly one of the nine items listed above, the benefits of maintaining the water bodies as they are currently maintained and the adverse consequences of the proposed project not only to my clients but to many of the land owners that are in close proximity to the affected water bodies, have not been considered by your agency. Further, your agency has failed to evaluate any of the advantages and has only cursorily reviewed the disadvantages to maintenance of the current condition of the Lake levels. Additionally, the pollution and other adverse consequences related to the burning proposed by your agency's project has been ignored.

Although there is some mention of the economic advantage related to the project, that economic advantage has not been quantified and it appears to be de minimus. On the other hand, the enormous detrimental impact to the economy and to my clients that would be caused by the project would far out way the economic benefits of maintaining the Lake levels. Also, the overall economic impact of the project likely will severely damage the local economy.

There has been no evaluation by the agency of the increased liability and the likely injuries and damages that will result from the lowering of the water bodies.

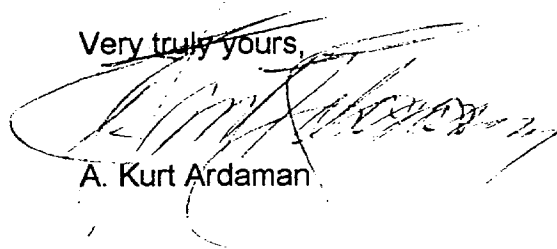
The inability to replenish these water bodies in the event of further insufficient rain fall is of grave concern not only to my clients but to other property owners, and should be of grave concern to your agency. No evaluation of the long term adverse consequences to the economy, ecology or any other matter has been carried out.

Mr. Jim Carnes  
May 21, 1997  
Page 3

Finally, there has been no discussion or analysis of alternative methods to accomplish the stated objectives of the project. Moreover, no cost/benefit analysis, not only of the proposed project but of any viable alternative has occurred.

This letter serves as a demand on behalf of my clients that the project and the draw down of the water bodies not occur unless and until proper evaluation and study has occurred and protection against the adverse consequences to my clients as listed above is provided by your agency. If proper evaluations, study and protections are not provided, the project should be terminated.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'A. Kurt Ardaman', is written over the typed name. The signature is fluid and cursive.

A. Kurt Ardaman

AKA/adr  
Enclosure

cc: Se' Belle Smith Dymmek  
Dosia Mae Smith Jimenez  
Miranda Rose Smith Bailey  
Herbert A. Smith, Jr., Trust  
Mr. Gary Dymmek

## RESPONSES TO COMMENTS FROM A. KURT ARDAMAN

COMMENT: The proposed project to draw down the water levels in the Alligator Chain of Lakes and Lake Gentry would cause many detrimental effects, some of which are listed below:

1. A loss of water for irrigation of the groves and watering of the livestock.

RESPONSE: See Sections 2.02.1 and 4.11 and the EIS.

2. Lowering of ground water, requiring greater irrigation needs and increasing vulnerability of the groves to freezes and other adverse effects.

RESPONSE: See Sections 2.02.1, 4.10 and 4.11 of the EIS.

3. Increased liability to landowners adjacent to the water bodies do to trespass concerns.

RESPONSE: See Section 4.13 of the EIS.

4. Lowering of water levels in other lakes such as Pearl Lake and Brick Lake.

RESPONSE: See Section 2.02.1 of the EIS and Item 3 of Appendix I.



Florida Department of Agriculture & Consumer Services  
BOB CRAWFORD, Commissioner  
The Capitol • Tallahassee, FL 32399-0800

Please Respond to:

June 7, 1999

Ms. Christine Bauer  
Planning Division/Environmental Branch  
Department of the Army  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Subject:        **Response to Draft Environmental Impact Statement (EIS) on Proposed  
Alligator Chain Extreme Drawdown Project**

Dear Ms. Bauer:

The purpose of this letter is to provide comment to the Corps regarding the subject draft EIS. Our detailed comments follow below, however, in general the Florida Department of Agriculture and Consumer Services (FDACS) continues to have very significant concern with the potential effect of this project on agricultural water supplies for aquaculture and the sufficiency of contingent mitigation for these potential impacts. We believe that one of the fundamental objectives of the Kissimmee River Comprehensive Plan, as enumerated by the Corps, related to the provision of water supply for agricultural uses, is likely to be violated if the drawdown is initiated without specific protections in place.

The FDACS Office of Agriculture Water Policy is charged with working with the state's five water management districts, Florida Department of Environmental Protection and other agencies to help facilitate agricultural regulatory issues while upholding environmental safeguards. In this regard FDACS has been involved in the Alligator Lake and Lake Gentry extreme drawdown/habitat enhancement project proposal for over two years now; responses to date include a 1997 letter from FDACS to the Corps on its Proposed Finding of No Significant Impacts, as well as general correspondence to the South Florida Water Management District (SFWMD) - the local sponsor for the Central and Southern Florida (C&SF) Project.

We recognize that this issue is very complex and somewhat emotionally charged, especially in light of the fact that the livelihood of surrounding ornamental fish farmers, who primarily rely on intercepting groundwater, depends on reliable water levels both within the production ponds themselves and the associated hydrologic surface features. Thus, with respect to both water supply and impact mitigation, we would encourage the agencies which are



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**Florida Agriculture and Forest Products**  
**\$53 Billion for Florida's Economy**

Ms. Christine Bauer  
June 7, 1999  
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implementing this project to continue to analyze the pertinent data, especially those data points affecting the MIKE SHE predictive model(s) output. Our specific comments, listed in ascending (page) order, are as follows:

(1) Page 2, Section 1.06 entitled, "Background" - Provides recognition for the fact that water levels in the Kissimmee Basin lakes have been regulated by C&SF project works since the 1960's. In fact, based on the above-mentioned, Environmental Assessment and Finding of No Significant Impact for the Alligator Lake Chain and Lake Gentry Habitat Enhancement Project, "provision of water supply for agricultural uses in the area around the lakes and along the Kissimmee River" is a key objective of the Kissimmee River Basin and Related Areas GDM. As indicated above, FDACS is concerned that one of the fundamental objectives of the Kissimmee River Comprehensive Plan regarding agricultural water supply may be violated if the full drawdown is initiated without specific protections in place.

Furthermore, it is our understanding that SFWMD may need to rely on surface water pumps placed at the north end of Trout Lake to "finish" the extreme drawdown in order to reach the desired target elevation of 60.0 feet. Pursuant to subparagraph 373.223(1)b, Florida Statutes, which states that issuance of a permit "will not interfere with any presently existing legal use of water", the FDACS recommends that the Corps fully consider the regulatory and possible legal ramifications surrounding the drawdown and the predicted impacts to at least two (i.e., Moonlight and Blackwater Fisheries) neighboring fish farms. While it is recognized that only some of the fish farmers have regulated wells pursuant to 40E-2, Florida Administrative Code (F.A.C.), and that the drawdown's influence on the surficial aquifer may have negligible impact on the well's ability to function and continue to pump (without going dry), this water user scenario is unique in that the fish farmers rely on intercepting static groundwater and pump only occasionally to augment and offset evaporative losses due to drought, normal dry season ground water table fluctuations, etc. Use of this surficial water resource in the aquacultural production ponds (which meets the definition of surface waters pursuant to Chapter 62-340.600(2), F.A.C.) should be afforded legal protection from adverse drawdown impacts similar to other water users, wetlands, and lakes.

Lastly, this section should also note that the Ornamental (Tropical) Fish Farming Industry, as a whole, comprises approximately 50 million dollars of total aquaculture sales of 102 million dollars in 1997 (Florida Agricultural Statistics Service, June 1998).

(2) Page 13, Section 4.01 entitled, "Vegetation" - The word "provide" appears twice on line six.

(3) Page 19, Section 4.10.5 entitled, "Potential Benefit of Drawdown to Freeze Protection" - Lists

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Page Three

the long-term impact of the drawdown on freeze protection as positive by virtue of removing the dense plant growth/vegetative buffer which forms the littoral zone for Alligator Lake. While the FDACS would agree with the EIS's assertion that the proposed drawdown facilitates habitat enhancement in the broad littoral zones affected by the proliferation of nuisance/exotic aquatic plant species along this fringe, we would not agree with the presumption that this vegetation has a significant impact and would "block the direct flow of air from the warm water to the groves". Emergent vegetation notwithstanding, we would contend that the high heat storage capacity of water and its ability to release latent heat is the "driving force" in providing passive freeze protection to associated agricultural lands.

(4) Page 22, Section 4.12.1 entitled, "Conflicts and Controversy/ Moonlight and Blackwater Fisheries" - Predicts, under severe drought conditions, water levels are projected to be lowered by a maximum of 1.5 feet on Moonlight. As indicated in comment No. 1 above, modeled drawdown of aquaculture production pond (surface) water in excess of one foot is not consistent with Chapter 40E-2, F.A.C., and associated Basis of Review criteria. Similarly, the EIS does not appear to adequately address potential secondary and cumulative impacts to both state jurisdictional wetlands and Corps "waters of the United States" in and around the Alligator Chain of Lakes as a result of the extreme drawdown. Compounding this problem is the fact that following the test drawdown of April, 1998, Alligator Lake apparently struggled to reach its "winter pool" elevation of 64 feet. In contrast, non-phosphate mines, which the water management districts routinely review under surface and groundwater rule(s) purview, would require - by permit - retrofits such as hydraulic barriers to offset impacts similar to those predicted for the drawdown.

(5) Page 23, Referencing Appendix II - The EIS states that the SFWMD analysis has been peer reviewed. Data submitted by the District as a basis for identifying potentially impacted farms should continue to be peer reviewed. Methods for data collection and analysis should be qualified before the drawdown project is initiated. It is our understanding that a national peer review committee exists and, based on current modeling nuances and the debate over input parameters, we would encourage all applicable technical parties to reach a consensus on the modeling, and data collection and analysis, before proceeding.

(6) Page 27, Section 7.03 entitled, "Coordination" - Predicted impacts to at least two farms have precipitated a number of protective measures/retrofits to be considered to offset the impacts. The FDACS strongly recommends that this remedial effort should be expanded and coordinated as part of a larger "Contingency Plan". An adequate plan would include protective measures for potential impacts to any affected farm in the event the actual effect of the drawdown is at variance with the MIKE SHE model results. FDACS believes it would be a reasonable approach to specify grower restitution as part of the Contingency Plan in the event adverse impacts to the growers as a result of the drawdown are realized.



Ms. Christine Bauer  
June 7, 1999

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We appreciate this opportunity to provide comments on this important project. Please feel free to contact Mr. Bill Bartnick (850/414-1065) of the Department who is available to work with the Corps to provide additional information or assistance as needed.

Sincerely,

**BOB CRAWFORD**  
**COMMISSIONER OF AGRICULTURE**



Charles C. Aller, Director  
Office of Agriculture Water Policy

cc: Senator Charles Bronson  
Ms. Ann Wainwright  
Dr. Martha Roberts  
Ms. Terry Rhodes  
Mr. Jim Harvey

RESPONSES TO COMMENTS FROM FLORIDA DEPARTMENT OF AGRICULTURE  
AND  
CONSUMER SERVICES  
THE CAPITOL, TALLAHASSEE, FL 32399

COMMENT: (1) FDACS is concerned that one of the fundamental objectives of the Kissimmee River Comprehensive Plan regarding agricultural water supply may be violated if the full drawdown is initiated without specific protections in place.

RESPONSE: The Central and Southern Florida (C&SF) Project was designed and constructed by the U.S. Army Corps of Engineers. The local sponsor for the C&SF Project is the South Florida Water Management District (SFWMD). The SFWMD operates and maintains the project works in accordance with Corps approved criteria, is responsible for water supply allocation from the project, unless where specified by Federal Law. Water control plans contain regulation schedules and operating criteria for the project. Water control plans must blend all the varied and often conflicting project purposes.

In the General Design Memorandum (GDM) for the Kissimmee River Basin (1956) the objectives of the plan for the Kissimmee River Basin were:

- a. Protection of lands adjacent to the lakes and along Kissimmee River from frequent and prolonged flooding.
- b. Provision of water supply for agricultural uses in the area around the lakes and along the Kissimmee River.
- c. Maintenance of lake stages at a desirable level for fish and wildlife and recreational purposes.
- d. Consideration of the relation and any adverse effects that improvements planned for Kissimmee River Basin might have on Lake Okeechobee, and finding means of preventing or reducing such adverse effects.

The GDM stated that urban areas in the Kissimmee River Basin were relatively small, and that adequate water supplies could be obtained from groundwater wells. At the time of the GDM preparation (1956) a few agricultural areas were furnished water and large areas suitable for irrigation had not been developed since they were also subject to frequent flooding. With lake levels regulated to prevent flooding, additional lands could be developed and irrigated. In the GDM, irrigation benefits were not considered separately since the project would not provide agricultural water to any areas where it was not already available under natural (or pre-project) conditions. Under natural conditions, the lakes in the Kissimmee Basin fluctuated seasonally through a range in stage varying about 2 to 10 feet. The GDM stated the lakes could be regulated to prevent much of the fluctuation that occurred under natural conditions with increased

outlet capacities provided with the project. However, the GDM noted fish and wildlife benefits are increased by seasonal fluctuations. The amount of seasonal fluctuation in lake stages was developed by determining the effect of various water levels on flood control, low-water regulation, ground water, fish and wildlife, and recreational benefits. The preliminary studies in the GDM indicated that seasonal fluctuations of about 4 feet would be satisfactory to fish and wildlife interests and would produce additional flood control benefits, but such large fluctuations on some lakes would be objectionable to local interests. The GDM stated since changes in the regulation schedules below the elevation of the flood control pool would not affect the design of canals and structures, additional studies of benefits obtainable from formulation of a revised regulation schedule could be made at any future time when greater overall benefits of the change could be demonstrated.

Since completion of Kissimmee Basin project works in the 1970's the water levels have been restricted to a fairly narrow range of fluctuation. According to the FWC these stabilized water levels have resulted in habitat degradation. Problems associated with degraded habitat can be reversed to a large extent through the use of an extreme drawdown and associated habitat enhancement project. The regulation schedules used for the Kissimmee Chain of Lakes apparently have not maintained lake levels at a desirable level for fish and wildlife purposes. The FWC, in cooperation with the SFWMD, has proposed a habitat enhancement project for Lake Alligator to address the effects of 30-35 years of inadequate lake level fluctuations due to the C&SF Project. The SFWMD, as local sponsor, is requesting that the Corps of Engineers approve changes in the regulation schedules to permit an extreme drawdown. Modifications to the planned extreme drawdown and habitat enhancement project have been proposed to reduce the potential for adverse impacts from the project (see response to FDACS comment #6). The proposed extreme drawdown project appears to be consistent with the federal objectives for the Kissimmee River Basin as referenced in the General Design Memorandum.

COMMENT: (2) Page 13, Section 4.01 entitles "Vegetation" - the word "provide" appears twice on line six.

RESPONSE: This has been corrected.

COMMENT: (3) While FDACS would agree with the EIS's assertion that the proposed drawdown facilitates habitat enhancement in the broad littoral zones affected by the proliferation of nuisance/exotic aquatic plant species along this fringe, we would not agree with the presumption that this vegetation has a significant impact and would "block the direct flow of air from the warm water to the groves". Emergent vegetation notwithstanding, we would contend that the high heat storage capacity of water and its ability to release latent heat is the "driving force" in providing passive freeze protection to associated agricultural lands.

RESPONSE: While it is reasonable to assume that emergent vegetation may not block the direct flow of air from the warm water to the groves, dense woody vegetation

most certainly could. Woody species such as red maple and willow often overtake herbaceous species in disturbed areas, such as those altered for agriculture. State agencies have actually been asked by citrus growers to remove trees growing between their groves and the lakefront.

COMMENT: (4) Section 4.12.1, entitled "Conflicts and Controversy/Moonlight and Blackwater Fisheries" - predicts, under severe drought conditions, water levels are projected to be lowered by a maximum of 1.5 feet on Moonlight. Modeled drawdown of aquaculture production pond (surface) water in excess of one foot is not consistent with Chapter 40E-2, F.A.C., and associated Basis of Review criteria. Similarly, the EIS does not appear to adequately address potential secondary and cumulative impacts to both state jurisdictional wetlands and Corps "waters of the United States" in and around the Alligator Chain of Lakes as a result of the extreme drawdown. Compounding this problem is the fact that following the test drawdown of April, 1998, Alligator Lake apparently struggled to reach its "winter pool" elevation of 64 feet.

RESPONSE: According to SFWMD, the changes in operational activities necessary for the lake drawdown are not considered to be a consumptive use of water, as regulated under Part II, Chapter 373, or implementing rules of the water management district (Chapter 40E-2, F.A.C. and associated Basis of Review). Authorization for the environmental resource permit activities associated with the project has been received from the Department of Environmental Protection. The U.S. Army Corps of Engineers sets criteria for regulation of water levels in lakes and canals within the Kissimmee Chain of Lakes and the appropriate authorization to cause the lake drawdown will be requested from the Corps. According to SFWMD, there is no state regulatory authorization required for the lake drawdown aspect of the Alligator Lake Project.

No secondary or cumulative wetland impacts are expected from this project. On the contrary, the project is being done to enhance the quality of habitat in lake littoral zones and associated wetlands. Periodic dry conditions are a natural response to low rainfall, and historically had triggered such beneficial events as compaction of organics and fire. As discussed earlier, extreme water fluctuations played an important role in sustaining extensive areas of high-quality aquatic habitat. Stabilized water levels brought about by regulation schedules have lead to an artificial and narrow restriction of the range in which the Alligator Chain and Lake Gentry's water levels historically fluctuated. Long-term stabilized water levels lead to degradation of habitat value in adjacent wetlands as well as the lakes' littoral zones.

As discussed in the response to comment #5 from the Law Offices of William E. Guy, Jr., the regulation schedule for the lakes of the Alligator Chain shows the rules for releasing water through the S-60 spillway; it does not guarantee that the water level in these lakes will rise to their regulation schedule. Also as discussed in the response to comment #5, the inability of Lake Alligator water level to reach the high pool stage of 64 feet during November 1998 through March 1999 was a not an unusual event, and

appears to be due to the dry conditions experienced in the Kissimmee Basin during June 1998 through March 1999, not the test drawdown in 1998.

COMMENT: (5) The EIS states that the SFWMD analysis has been peer reviewed. Data by the District as a basis for identifying potentially impacted farms should continue to be peer reviewed. Methods for data collection and analysis should be qualified before the drawdown project is initiated. It is our understanding that a national peer review committee exists and, based on current modeling nuances and the debate over input parameters, we encourage all applicable technical parties to reach a consensus on the modeling , and data collection and analysis, before proceeding.

RESPONSE: The SFWMD submitted the *Analysis of Projected Impacts of the Alligator Chain Drawdown Project on the Surrounding Water Table Aquifer - July 28, 1998* and the *Alligator Lake Drawdown Study Model Documentation - August 26, 1998* to peer review. Three experts in hydrologic modeling were selected and sent the reports in December 1998. The SFWMD has done additional work in response to the comments received from the experts. This work has been incorporated into SFWMD's analysis and a revised report has been produced (included as APPENDIX II).

According to SFWMD, the experts were asked to review the documents and provide comments. It was requested that their review specifically address questions pertinent to the theme of the study. Additional work was undertaken by SFWMD in response to comments received from the outside peer review panel and others. This work included changes to the model boundary conditions. The boundary for the original model was based on surface water basin divides. In order to address concerns that this boundary might lead to boundary effects in the groundwater at some areas of interest, the model was expanded both to the east and west. Another model change was to the topography used in the model. Soft data, SPOT imagery and NWI wetland classifications were used in combination with the USGS point elevations to improve the representation of topography within the Big Bend Swamp. The C-33 Canal was added as a river using the model's river package to better estimate water levels in the area between Alligator Lake and Lake Gentry. After making these model modifications, the calibration period (8/97 - 6/98) was re-run to verify that the model was still working correctly, and a verification simulation was run (6/98 - 12/98) to assess model performance through the prolonged dry period. The model verification run was made to compare model predictions to actual water levels in the monitoring wells. In both cases no significant deviation from the calibration response was observed.

According to SFWMD, the most common suggestion from the expert reviewers was the application of soft data to test the reasonableness of the model. In other words, if there is a wetland in a particular location, does the model predict that it gets wet there, and does it stay dry where it is supposed to be dry? An analysis of the model was performed to address this question. For example, in the southern portion of the model, encompassing Big Bend Swamp, the model predicts ponding of water on the surface in the wetlands and it stays dry outside of them. It may also be noted that although the wetlands fill up after a rain, they do not stay wet as long as they would in the real world. It was necessary when using the overland flow component of the model to specify the

elevation to which water is allowed to flow. It was specified that it be allowed to flow right down to ground surface. In reality, much of the water in the swamp would probably be restricted to isolated ponds long before this, but limited topographic data was available on which to base controlling elevations. Given the need to assess the effects of dropping swamp elevations on the fish farms, land surface was determined to be the most appropriate assumption (this assumption tends to make the model over predict impacts). This analysis showed that the model was predicting ponding in appropriate locations.

COMMENT: (6) Predicted impacts to at least two farms have precipitated a number of protective measures/retrofits to be considered to offset the impacts. The FDACS strongly recommends that this remedial effort should be expanded and coordinated as part of a larger "Contingency Plan". An adequate plan would include protective measures for potential impacts to any farm in the event the actual effort of the drawdown is at variance with the MIKE SHE model results. FDACS believes it would be a reasonable approach to specify grower restitution as part of the Contingency Plan in the event adverse impact to the growers as a result of the drawdown are realized.

RESPONSE: The planned Alligator Chain extreme drawdown elevation was changed from 58.5 ft NGVD to 60.0 ft NGVD. The South Florida Water Management District has reviewed the potential hydrologic impacts from the proposed project. The analysis report is included as APPENDIX II. The SFWMD and FFWCC have proposed that the extreme drawdown of Lake Gentry be postponed to a year subsequent to the year in which the Alligator Chain's extreme drawdown begins. Therefore, the Lake Gentry Postponement Alternative has been adopted as the preferred alternative. This modification to the project plan will reduce any potential impacts to the ponds at Moonlight Fisheries. The SFWMD will also continue to explore additional measures that could be taken on site to decrease water loss from Moonlight Fisheries. Osceola County has expressed a willingness to place a weir in the Blackwater ditch in order to decrease surface drainage from the farm to offset the increased flow through the aquifer caused by the project. Installation of a structure to maintain water levels in Brick Lake higher than in the rest of the Alligator Chain during the Alligator Chain's extreme drawdown has been proposed. The original plan for a temporary structure to maintain water levels in Brick Lake would have the temporary structure located in Brick Lake Canal. However, negotiations with landowners were unsuccessful. Therefore, if a temporary structure is installed to maintain water levels in Brick Lake, it will not be located in the original planned location in Brick Lake Canal. As of mid-August 1999, the SFWMD is considering installation of a water control structure in Alligator Lake just outside of Brick Lake Canal. However, there is no guarantee that the additional measures to decrease water loss from Moonlight Fisheries, installation of the proposed weir in the Blackwater ditch, or installation of the proposed structure to maintain water levels in Brick Lake, will be undertaken.

SFWMD's groundwater modeling results indicate that the other fish farms are outside the area of influence of the drawdown. The SFWMD will continue to monitor

groundwater levels in these areas. This will allow for determination of whether the actual influences of the project are extending beyond those anticipated based on the hydrological analysis.

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WILLIAM E. GUY, JR.\*  
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\*\*\* ADMITTED IN FLORIDA AND NEW YORK

June 2, 1999

U.S. Army Corps of Engineers  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

and

Christine Bauer  
CESAJ-PD-ES  
U. S. Army Corps of Engineers  
400 West Bay Street  
Jacksonville, FL 32202-4112

Re: Comment on Draft EIS for Alligator Chain of Lakes project

To whom it may concern

Pursuant to the direction of Hanley K. Smith, please accept the submission of this comment on the Draft Environmental Impact Statement for the Alligator Lake Chain and Lake Gentry Extreme Drawdown and Habitat Enhancement Project.

**I. COMMENTS**

① ALL NECESSARY PERMITS REQUIRED BY THE STATE OF FLORIDA HAVE  
NOT BEEN ISSUED FOR THE ALLIGATOR CHAIN OF LAKES DRAWDOWN  
PROJECT

The Florida Game and Freshwater Fish Commission (FGFFC) has undertaken to conduct a drawdown and de-mucking of Alligator Lake. The project is located within Osceola County, Florida and is within the boundaries and jurisdiction of the South Florida Water Management District (SFWMD). The project contemplates drastically lowering water levels in Alligator Lake so that FGFFC may undertake a de-mucking project. The project essentially encompasses two phases, a drastic lowering of the lake level to expose lake bottom (drawdown), then, when sufficient lake bottom is exposed there will be a de-mucking and aquatic plant removal of the lake bottom (muck removal).

The SFWMD is fully aware of the scope of the project, as they have been an active participant in the project.

The "muck removal" aspect of the project is under the authority and regulatory control of the Florida Department of Environmental Protection (DEP). The "drawdown" is under the authority and regulatory control of the SFWMD, as demonstrated by Exhibit "A".

FGFFC has obtained a permit from the DEP with regard to the "de-mucking" and/or aquatic weed removal in the lakes.

FGFFC has not obtained a permit from SFWMD with regard to the "drawdown". FGFFC has not applied to SFWMD for a permit with regard to the "drawdown". SFWMD, despite being fully aware of the project, and despite being fully aware that they are the agency regulating the drawdown has not required FGFFC to apply for a permit.

Thus, no permit has been issued by SFWMD or any other authority relating to the "drawdown" aspect of this project.

In the "Analysis of the Projected Impacts of the Alligator Chain Drawdown Project on the Surrounding Water Table Aquifer" authored by SFWMD and previously provided to the USACE, SFWMD admits that the "drawdown" will effect the surficial aquifer immediately beneath the Alligator Chain of lakes.

The document also demonstrates that there will be an alteration of the surface waters of the Alligator Chain of lakes by drawing the lake levels down.

Pursuant to Fla. Admn. Code 40E-4.011, a copy of which is attached as Exhibit "B", SFWMD is responsible for regulating activities in, on or over wetlands or other surface waters and is responsible for regulating management and storage of all surface waters within its boundaries.

Pursuant to Fla. Admn. Code 40E-4.041 a copy of which is attached as Exhibit "C", unless expressly exempt by law or rule, it is unlawful for any party to construct, alter, operate,



maintain, remove or abandon any storm water management system, dam impoundment, reservoir, appurtenant work without first having obtained an environmental resource permit from the SFWMD.

The "drawdown" is an activity in, on or over wetlands or other surface waters within the boundaries of the SFWMD, pursuant to Fla. Admn. Code 40E-4.011.

The Alligator Chain of Lakes constitutes a storm water management system, dam impoundment, reservoir, or appurtenant work pursuant to Fla. Admn. Code 40E-4.041.

Thus, pursuant to Fla. Admn. Code 40E-4.011 and 40E-4.041, SFWMD must issue a permit for the "drawdown", unless there is an express exemption in law or rule.

The permissible exemptions are listed in Fla. Admn. Code 40E-4.051, a copy is attached as Exhibit "D".

Pursuant to Fla. Admn. Code 40E-4.051, the "drawdown" does not fit any of the listed exemptions.

Based on the above, it would be unlawful for the Alligator Chain of Lakes drawdown to occur without issuance of an environmental resource permit by the SFWMD.

Therefore, the permitting of this project is not complete.

② THE "TEST DRAWDOWN" CONDUCTED BY SFWMD IN APRIL OF 1998 WAS AN "UNLAWFUL" ACTIVITY PURSUANT TO FLA. ADMN. CODE 40E-4.011 AND 40E-4.041

Between April 1-14, 1998, SFWMD conducted a "test drawdown" of the Alligator Chain of lakes. In accordance with the "test drawdown" water levels in the Alligator Chain were dropped approximately 2 feet within 14 days April 1 - 14.

No permits whatsoever, were applied for or obtained in accordance with this "test drawdown".

Pursuant to Fla. Admn. Code 40E-4.011, SFWMD is responsible for regulating activities in, on or over wetlands or other surface waters and is responsible for regulating management and storage of all surface waters within its boundaries.

Pursuant to Fla. Admn. Code 40E-4.041, unless expressly exempt by law or rule, it is unlawful for any party to construct, alter, operate, maintain, remove or abandon any storm water

management system, dam impoundment, reservoir, appurtenant work without first having obtained an environmental resource permit from the SFWMD.

The "test drawdown" was an activity in, on or over wetlands or other surface waters within the boundaries of the SFWMD.

The Alligator Chain of Lakes constitutes a storm water management system, dam impoundment, reservoir, or appurtenant work pursuant to Fla. Admn. Code 40E-4.041.

Thus, pursuant to Fla. Admn. Code 40E-4.011 and 40E-4.041, it was unlawful for SFWMD to permit the "test drawdown", unless there was an express exemption in law or rule.

The permissible exemptions are listed in Fla. Admn. Code 40E-4.051.

Pursuant to Fla. Admn. Code 40E-4.051, the "test drawdown" does not fit any of the listed exemptions.

Based on the above, it was an unlawful act for SFWMD to conduct the "test drawdown" without issuance of an environmental resource permit.

③ NEITHER SFWMD NOR USACOE HAS SPECIFICALLY CONSIDERED THE POTENTIAL FOR IMPACTS TO WETLANDS IN AND AROUND THE ALLIGATOR CHAIN OF LAKES AS A RESULT OF THE "DRAWDOWN"

In reviewing the Draft Environmental Impact Statement issued by the USACOE, there has been no specific consideration as to how the Alligator Chain of lakes project will or could potentially impact the wetlands in and around the Alligator Chain of lakes, such as the Big Bend Swamp.

SFWMD has concluded as a result of its modeling that the surficial aquifer in and around the Alligator Chain of lakes will be affected by the "drawdown". Thus, if the surficial aquifer were depleted to any degree whatsoever, the "drawdown" could pose numerous and significant secondary and cumulative impacts to the wetlands in and around the Alligator Chain of lakes.

Some of the potentially affected wetlands are within the jurisdiction of SFWMD and some are within the jurisdiction of the USACOE as "waters of the United States".

One potential impact to the wetlands in question is their inability to maintain "wet" conditions as a result of the disturbance to the surficial aquifer. If the wetlands are permitted to dry out, there will be a corresponding increase in nuisance vegetation, thereby degrading the existing wetlands.

Thus, since the effects to the surrounding wetlands have not been researched, there's no way to know if the cost of disturbing the wetlands outweighs the benefits of permitting this project.

Further, as evidenced in the Affidavit of Arthur David Castelli included in this submission, the portion of the Big Bend Swamp adjacent to Castelli Farms was in fact dried out as a result of the "test drawdown" and is yet to recover to its pre-"test drawdown" water levels. It is therefore reasonable to assume that the dessication of the Big Bend Swamp has caused the expansion of undesirable terrestrial vegetation in the Big Bend Swamp and in the other wetlands within the "test drawdown's" zone of influence.

SFWMD has failed and refused to address the concerns raised with regard to the surrounding wetlands by failing to require that an environmental resource permit be obtained for this project.

It also appears that the USACOE has failed to consider the potential issues of the impacts to the surrounding wetlands, notwithstanding the fact that a permit has been issued by the USACOE pursuant to Section 404 of the Clean Water Act.

As a result, SFWMD should initiate permitting procedures for this project and the USACOE should reconsider the permit issued under section 404 of the Clean Water Act.

**4 THE UNITED STATES FISH & WILDLIFE SERVICE FAILED TO REQUIRE FGFFC TO DOCUMENT THE FLYWAYS AND FORAGING SITES FOR BALD EAGLE NEST**

In the USACOE FIS report it is noted that there is an eagle's nest within 0.8 miles of the project area. When an eagle's nest is within 1 mile of a project area, the United States Fish and Wildlife Service normally requires applicants to undertake a detailed study of the eagle's flyways and foraging grounds pursuant to the Habitat Management Guidelines. In this case, the USFWS failed to require the applicant to conduct a detailed study of the eagles flyways and foraging grounds as would be required of any other applicant.

FGFFC must be required to undertake a study of the flyways and foraging grounds of the eagles at the nest which is .8 miles away from the project area.

**5 THE FAILURE OF ALLIGATOR LAKE TO REACH WINTER POOL LEVEL AFTER THE "TEST DRAWDOWN" DEMONSTRATES A SIGNIFICANT IMPACT FROM THIS PROJECT**

The SFWMD has recognized that water levels in the Alligator Chain of lakes is maintained at what is commonly referred to as "summer pool" level and "winter pool" level.

"Winter pool" levels of approximately 64.0 feet. "Summer pool" levels refer to a water level of approximately 62.0 feet. In other words, during the "winter" months the Alligator Chain is normally maintained at approximately 63.8 feet, while in the "summer" the Chain is maintained at approximately 62.0 feet.

During the "test drawdown" the water level in the Chain was dropped from approximately 63.8 feet to 62.0 feet between April 1 - 14, 1998. SFWMD has indicated that April is approximately the normal time to begin taking the Alligator Chain from "winter pool" to "summer pool". In normal years however, the change takes some 2 1/2 months to accomplish as opposed to 14 days, as occurred in 1998.

SFWMD records show that during the winter of 1998-99, the Alligator Lake never reached its "winter pool" level of approximately 64 feet. In fact, as of January 1999, Alligator Lake had only reached a level of approximately 62.5 feet.

Thus, it appears that contrary to the modeling of SFWMD, the "test drawdown" which SFWMD expected to cause only minimal impacts over the short term, actually had substantial impacts over a significant period of time, in that Alligator Lake failed to re-charge within the period of approximately 1 year.

SFWMD's research, investigation and study should therefore not only be limited to the narrow issues raised in their "Analysis of Projected Impacts of the Alligator Chain Drawdown Project", but rather, SFWMD and/or the other appropriate regulatory agencies should be required to make a comprehensive investigation of all known and potential environmental consequences of this project.

**6 ALL LAKES IN THE AREA ARE HYDROLOGICALLY CONNECTED CONTRARY TO THE ASSERTIONS OF SFWMD**

In January of 1999, the SFWMD began releasing water from Lake Tohopekiliga through S-61 gate. At the time, it appears Lake Tohopekiliga was at or near its "winter pool". At the time, Alligator Lake was not.

Specifically, SFWMD records show that the S-61 lock on Lake Tohopekiliga was opened on 1/28/99 and opened additionally on 2/4/99. The lock was closed on 2/17/99 and re-opened 3/25/99. SFWMD records also show that Alligator Lake had changes in water levels that closely correspond to the water level changes in Lake Tohopekiliga resulting from opening the control structures. This despite the fact that SFWMD records show that the control structure on Alligator Lake was not open at the same time.

Thus, notwithstanding the fact that Alligator Lake had not reached its "winter pool" level in January 1999, and was only marginally above its "summer pool" level, it appears that the SFWMD caused Alligator Lake to be further depleted of water through dropping the level of Lake Tohopekaliga. It therefore appears as if the lakes in the area are all connected in some manner.

There has been a total lack of research in to the secondary and cumulative effects of this project with regard to the hydrologic connections and potential impacts of this project on the Alligator Chain. SFWMD should therefore make a comprehensive review of all factors involved in the drawdown, and make a comprehensive study of all potential impacts as a result of this "drawdown".

7 **THE CENTRAL AND SOUTH FLORIDA PROJECT PRECLUDES PERMITTING FGFFC'S DE-MUCKING PROJECT**

As indicated in section 1.06 Background of the Draft EIS, the Central & Southern Florida Project (C&SF) has regulated the Kissimmee Basin Lakes since the 1960's. The C&SF therefore constitutes a comprehensive federal regulation of the Kissimmee Basin Lakes. C&SF Part II - Supplement 5 states as an objective for the Kissimmee River Comprehensive Plan, "b. Provision of water supply for agricultural uses in the area around the lakes and along the Kissimmee River."

The Kissimmee Basin Lakes includes the Alligator Chain of Lakes. The fish farms which are in close proximity to Alligator Lake are agricultural uses in and around the Kissimmee Basin Lakes. Thus, it is a federal objective for the Kissimmee River Basin Plan to provide a water supply to the fish farms.

The fish farms have documented, through the attachments to this Comment, a severe and dramatic effect as a result of the "test drawdown" which occurred in April of 1998. That result being a drastic drop in water levels roughly corresponding in time with the "test drawdown". As a result, of the "test drawdown", the SFWMD preempted the federal C&SF by preventing the fish farms from having an adequate water supply.

SFWMD therefore impermissibly preempted federal law in undertaking the "test drawdown". Further, if the actual drawdown is permitted, that act will also constitute an impermissible preemption of federal law by the FGFFC.

The project should therefore be comprehensively reviewed and redesigned in such a fashion as to comply with federal requirements.

8 **LOWERING ALLIGATOR LAKE TO 60.0 FEET RATHER THAN 58.5 FEET WILL HAVE NO PRACTICAL BENEFIT TO THE FISH FARMERS**

In section 2.02.1 of the Draft EIS, a modification to the drawdown is discussed. One modification proposed is to only drop the water level in Alligator Lake to 60.0 feet rather than 58.5 feet.

As a result of the April 1998 "test drawdown", wherein water levels were dropped to 62.0 feet, each of the fish farms were adversely affected by a significant drop in water levels.

The effects, as documented in the affidavits and videotape which are submitted in connection with these Comments, were such that most of the fish farms were effectively put out of business due to the lack of water on their farms. Water levels at the farms have not returned to "normal" in the time since the "test drawdown".

Due to the fact that a drop in water levels from 63.8 to 62.0 feet during the "test drawdown" reduced water levels at the fish farms to the point where the farms could not operate, a drop in water levels of 2 additional feet to 60.0 feet will totally deprive all the farms of their groundwater supplies.

Therefore, the modification discussed in section 2.02.1 of the Draft EIS is a meaningless modification to the project as the fish farms will all be put out of business at 58.5 feet or 60.0 feet.

9 **THERE IS SUFFICIENT REASON TO EXPECT THE EXISTENCE OF CONTAMINATED OR HAZARDOUS SOILS**

Section 3.08 of the Draft EIS states essentially that there is no reason to suspect contaminated soils in the project area., notwithstanding the fact that there has been no testing to confirm that fact. Section 3.08 goes on to indicate that the lands draining in to the lakes are primarily agricultural.

It is well known however, that agricultural interests use large quantities of both fertilizers and pesticides. It is further known that when used, the pesticides and fertilizers drain from the land in the form of runoff and that these substances contaminate lake bottoms. As evidence of the effect of even a small amount of agricultural contamination on lake bottoms, one need look no further than Lake Apopka, which has been classified as a "danger zone" by the St. John's Water Management District and the U.S. Fish & Wildlife Service. A copy of an Orlando Sentinel newspaper article documenting the problems caused by pesticides in Lake Apopka is attached hereto as Exhibit "E".

In order to prevent another potential "danger zone" from being declared in the Alligator Chain of Lakes the appropriate regulatory agencies should undertake comprehensive risk studies of the effect of this project as are now being undertaken in the wake of the problems at Lake Apopka.

**10** **THERE IS COMPETENT EVIDENCE TO DISPUTE SFWMD'S  
GROUNDWATER MODELING FINDING THAT THERE WAS NOT AN ADVERSE  
EFFECT ON THE FISH FARMS**

Section 4.12 of the Draft EIS states that "SFWMD performed a groundwater modeling analysis which indicates that as of April 22, 1998, the aquifer response test had no effect on groundwater levels at the fish farms." SFWMD is therefore relying solely on its groundwater modeling and not documentation which could easily have been obtained, to support its assertions.

Had SFWMD consulted the available documentation, it would have discovered defects in the modeling.

Included in this Comment however, are the affidavits of Rhonda Walther, Arthur David Castelli, Loretta Gardner, Sheila Klingensmith, Marvin Johnson and Aubrey Duquesnay, all of which document a significant and adverse effect on the groundwater levels at the various fish farms as a result of the "test drawdown" in April of 1998. In addition, there is also included a videotape and photographs documenting a significant drop in water levels which corresponds roughly in time with the "test drawdown".

Thus, while SFWMD relies on modeling to assert there is no effect on the fish farms as a result of the "test drawdown", the fish farmers have provided competent documentation and evidence to demonstrate that contrary to the assertions based on SFWMD's groundwater model, there will be a severe adverse effect to the fish farms.

Based on the above, the regulatory agencies should undertake a comprehensive study of the potential impacts of this project.

**11** **IN ITS PRESENT STATE, NO REGULATORY BODY WOULD PERMIT ANY  
PRIVATE INDIVIDUAL OR ENTITY TO UNDERTAKE THIS PROJECT**

In reviewing the Draft EIS, section 1.02 recognizes that this project will affect a huge area of land in parts of Orange and Osceola Counties. Section 1.05 recognizes that a mere 2 permits have been issued for this project which will lower lake levels and admittedly affect the surficial aquifer.

It is inconceivable to believe that any private party could obtain 2 permits and undertake a project which would affect portions of 2 counties, would lower lake levels, would affect the surficial aquifer, would potentially damage or degrade thousands of acres of wetlands, would adversely affect agricultural interests, and which has failed to provide extensive documentation describing the cumulative impacts of the project and failed to provide any plan for mitigation and monitoring.

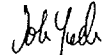
Thus, it would appear that the appropriate regulatory agencies are providing preferential treatment to this project merely because the permitted is another governmental entity. As a result, there is being established a dual standard of environmental regulation in the State of Florida. Therefore, this project should receive the same regulatory scrutiny that it would if the project were being proposed by a private party. Accordingly, the appropriate regulatory agencies should compel a comprehensive study to determine exactly how this project will affect the environment surrounding the Alligator Chain of Lakes.

**2. ATTACHMENTS**

Also included in this packet are the following:

1. Stemle Anderson & Associates, Inc. report analyzing the modeling used by South Florida Water Management District.
2. "Peer review" reports on the SFWMD modeling.
3. Analysis of the SFWMD's "peer review" reports by Stemle Anderson & Associates, Inc..
4. Affidavits of Rhonda Walther, Arthur David Castelli, Loretta Gardner, Sheila Klingensmith, Aubrey Duquesnay and Marvin Johnson attesting to the water levels on their individual farms immediately following the test drawdown in April of 1998.
5. Videotape documenting the drop in water levels at Castelli Farms, Sunset Tropicals and Mako Tropicals immediately following the test drawdown in April of 1998.
6. Photos documenting the drop in water levels at Castelli Farms, Blackwater Fisheries, Mako Tropicals, and Sunset Tropicals immediately following the test drawdown in April of 1998.

Sincerely,

  
John S. Yudin

JSY/pd

Enclosures: See Above

cc: Osceola Fish Farmers

# Stemle, Andersen & Associates, Inc.

ENVIRONMENTAL AND HYDROLOGIC CONSULTANTS

555 North Congress Avenue  
Suite 302  
Boynton Beach, FL 33426  
(407) 738-0017  
(407) 738-1106 FAX

5307 Pennock Point Road  
Jupiter, FL 33458  
(407) 745-9545  
(407) 745-9549 FAX

October 26, 1998

Mr. William E. Guy, Jr.  
Law Offices of William E. Guy, Jr.  
55 East Ocean Boulevard  
P.O. Box 3386  
Suntan, FL 34995-3386

Re: Alligator Chain Drawdown Report

Dear Ted:

Stemle, Andersen and Associates, Inc. has reviewed the technical documents provided by your firm and the Osceola Fish Farmers. This report summarizes our position and opinions regarding the Alligator Chain lake drawdown project and its effect on the nearby fish farmers.

The South Florida Water Management District (SFWMD) publication, "Analysis of Projected Impacts of the Alligator Lake Chain Drawdown Project on the Surrounding Water Table Aquifer", indicated that Alligator Lake drawdown to the surrounding water table aquifer does not extend beyond well OS181. Well OS181 is located at the corner of US 192 and County Road 554, a distance of 6,500 feet from Alligator Lake and 2,500 feet from a canal connecting Alligator and Buck Lake. We disagree with the SFWMD conclusion and their basis for drawing this conclusion. The two statements of fact provided by SFWMD ("First, the relative head differences between the water level at OS181 Well and S60 Headwater are consistent through out the record period." and "Second, the water table readings at Castelli Farms consistently ranged between OS181 and S60 Headwater.") are true but do not support the conclusion that water table declines do not extend beyond OS181. Clearly, the water level reductions in all the wells following the test drawdown (see Appendix E, Well Stage chart) show that groundwater levels and surface water levels are related and that when the lake stage levels change, the groundwater levels follow suit.

The model is most sensitive to horizontal hydraulic conductivity (Alligator Lake Drawdown Study Model Calibration, SFWMD, Page 21). Hydraulic conductivity is basically defined as the rate that water can move through the aquifer. Hydraulic conductivity in the model is based on a total of eight slug tests performed on partially penetrating wells completed in the surficial aquifer. Slug tests are generally best suited where permeability of the formation materials is too low to conduct a pumping test, and are typically not as accurate because of the small area influenced by the test. A pumping test (also referred to as an aquifer performance test) is a more precise method of measuring aquifer coefficients and is typically preferred by hydrogeologists for use in modeling. According to the reports reviewed, the SFWMD did not perform any pumping tests nor were existing pumping test data available for the modeled area. At a minimum, aquifer performance tests should have been conducted on the surficial aquifer at each farm where impacts

Letter to William E. Guy, Jr.  
October 26, 1998  
Alligator Chain Drawdown Assessment

Page 2

were to be evaluated. During calibration of the model, the hydraulic conductivity values, which were derived from the slug tests, were all increased by a factor of 8 to 10. In the model calibration process, input variables (such as hydraulic conductivity) are often altered somewhat to achieve correlation between field data and model results. The 8 to 10 fold increases in hydraulic conductivity, however, are unrealistically high for the typically fine sand that contains excess silt and clay as described in the SFWMD report.

It is unclear in the model documentation if surface water flow through the submerged wetlands, canals and ditches impact the modeled surficial aquifer correctly. In the model documentation, the initial heads were created by performing a test simulation. The test simulation included assigning to layers 1 and 2 an initial head of 4 feet below land surface and to layer 3 an initial head of 45 feet NGVD. Land surface is generally between 60 and 75 feet NGVD. Layers 1 and 2 represent the surficial aquifer and intermediate confining unit, layer 3 represents the Floridan Aquifer. The starting heads were selected based on one stress period in the test simulation that was found to have a water level in the model cell, containing well OS181, that was near the observed water level in well OS181. So the initial groundwater heads in layers 1 and 2 were based on one cell out of the 100 x 125 square grid cells. One groundwater data point is not an adequate basis for a model wide interpretation of starting heads. With the exception of the modeled lakes, no initial heads were measured in any of the wetland systems within the model area. Since the starting heads were originated at 4 feet below land surface, it is possible that water levels within the wetland systems were below land surface for the initial heads used in the model. This is a critical aspect of the basic model design. If flow in the modeled system is only permitted to travel through the cells that depict groundwater flow, then a farm such as Castelli's would appear to respond in the model as though it were 3.5 and 3.1 miles from the drawdown at Alligator Lake and Brick Lake, respectively. However, Big Bend Swamp, which is flooded and drains into Brick Lake and Gentry, is located adjacent to Castelli and Exotic Farms. As the lake chain water levels are lowered, the water levels in Big Bend Swamp will drop as water from the swamp drains into the lakes. As a result, the groundwater levels at the farms in proximity to the swamp will drop in response to the lowering of the lakes. The model should include surface water features such as swamps, canals, ditches and other regionally continuous drainage features, as they would actually function within the modeled domain. If the drainage option in the model is based on the relative difference between the groundwater surface and land surface elevations, then the initial heads for the model must be verified using field data (surface water and groundwater levels) collected from the anticipated drainage areas.

As you are aware, there is a difference of opinion over the amount impact at the farms following the April 1, 1998 test drawdown. Shallow wells, installed and monitored by SFWMD, recorded falling water levels at each farm following the start of the drawdown. The farmers also observed this change in their shallow fish ponds and monitor wells. This change in water level is the sum of many influences that affect groundwater levels, which were described in the SFWMD report. The objective of the SFWMD model, in our opinion, was to separate out what we will call the non-lake drawdown related influences, primarily evapotranspiration. To do this two hydrographs were plotted depicting water levels (see SFWMD publication, Analysis of Projected Impacts of the Alligator Lake Chain Drawdown Project on the Surrounding Water Table Aquifer, page 10). The first hydrograph shows the typical decline in water level as the lakes are lowered from winter pool to summer pool. (This is referred to as the base condition.) The second hydrograph is the decline recorded during the test drawdown (drawdown condition). The difference between these two hydrographs is the SFWMD interpretation of the impact caused by the test. SFWMD's rationale is that because water is typically released from the lakes during the winter

Attachment #1

Stemle, Andersen & Associates, Inc.

pool to summer pool transition, it is not part of the impact of the lake drawdown. This we will refer to as the "net drawdown". The Farmers, on the other hand, experience the total change in water levels caused by lowering lake levels regardless of how the lakes are lowered. The SFWMD has indicated to the farmers the difference between the net drawdown and the total drawdown is attributable to evapotranspiration. According to the Kissimmee Basin Water Supply Plan, beginning on March 15 of each year the SFWMD will release water from the Alligator Lake Subbasin to lower water levels two feet by June 1. During dry periods this transition may occur just with the minimal releases to maintain minimum flows. However, this transition generally involves significant releases of water from the subbasin. The water released from the subbasin is not evapotranspiration and therefore should be included as part of the test drawdown impact.

In summary, South Florida Water Management District's analysis does not support conclusions that the drawdown will not significantly effect area fish farms. Because the model does not correctly represent the hydrologic system within the modeled domain, the scenarios representing the full scale drawdown of Alligator, Brick and Gentry need to be reevaluated by the SFWMD.

We appreciate the opportunity to provide these services to you. Please contact me if you have any questions.

Sincerely,  
Stemle Andersen & Associates, Inc.

*[Signature]*  
James E. Andersen, P.G.  
Principal Hydrogeologist  
State of Florida Registered Geologist #1103

Pc: David Castelli, Castelli Farms  
Rhonda Walther, Blackwater Fishery

Stemle, Andersen & Associates, Inc.



cc: Walther, Stemle/An  
(for south) *fed*  
**South Florida Water Management District**

3301 Gun Club Road, West Palm Beach, Florida 33406 • (561) 686-6800 • FL WATS 1-800-432-2045  
TDD (561) 697-2574 • www.sfwmd.gov

MGT 10

April 9, 1999

John Yudin, Esq.  
Law Offices of William E. Guy, Jr.  
55 East Ocean Boulevard  
P.O. Box 3386  
Suart, FL 34995-3386

Dear Mr. Yudin:

Subject: Peer Review Report 5

Enclosed please find the above referenced Report.

My secretary, Rosie, will be in touch with you to finalize the date and time of our initial meeting.

If you have any questions, please do not hesitate to contact me (561) 687-6267.

Sincerely,

*[Signature]*  
Scott Allen Glazier

(Signed in Attorney's absence to expedite delivery)

SAG/rb

Enclosure

VIA FEDERAL EXPRESS

Attachment #2

Governing Board:  
Michael Collins, Chairman  
Michael D. Minton, Vice Chairman  
Mitchell W. Berger

Vera M. Carter  
Gerardo B. Fernandez  
Patrick J. Gleason

Nicolas J. Gutierrez, Jr.  
Harkley R. Thornton  
Trudi K. Williams

James Harvey, Interim Executive Director  
Michael Slayton, Deputy Executive Director  
Trevor Campbell, Deputy Executive Director

Mailing Address: P.O. Box 24680, West Palm Beach, FL 33416-6800

SS Papadopoulos & Associates, Inc.

January 19, 1999

Ms. Nancy H. Urban  
South Florida Water Management District  
3301 Gun Club Road  
West Palm Beach, FL 33406

Subject: Peer Review: Alligator Lake Drawdown Model

Dear Ms. Urban:

This letter summarizes my comments on the report "Analysis of Projected Impacts of the Alligator Chain Drawdown Project on the Surrounding Water Table Aquifer." I have included some editorial suggestions on portions of the text, along with my technical comments. I've done this because the study addresses a potentially controversial topic, which may be perceived as impacting the economic interests of various parties. The results will probably be subject to close scrutiny and criticism, particularly if litigation should ensue. It is therefore important not only that the analysis be valid, but also that it be presented and explained in a manner which will preempt, or at least answer, any potential criticism.

My comments are presented below in three sections. Section A is a general critique of the model, its application to the question at issue, and the way it is presented and justified in the report. Section B provides specific comments on statements in the first part of the report (pages 1 through 10). Section C contains my responses to the questions posed in the Scope of Work for this review. I apologize for the repetition which has crept in, but I believe it's better to be repetitive than to leave something out. I have not made specific editorial comments on the material in pages 11 through 26 of the text; these pages provide a straightforward discussion of the procedures used to evaluate lake drawdown impacts, and present the results of those evaluations. The method used is logical, and the results are as good as the model itself; and my comments on the merits and limitations of the model are given in Section A.

#### A. General Comments on the Model, its Application, and its Presentation in the Report

My overall opinion is that the model is reasonable, and that the results of the analysis are correct. However, I believe the calibration should be strengthened through the addition of a steady-state analysis, the question of the specific yield of the surficial aquifer should be addressed, and the discussions in the report should be expanded to emphasize the ways in which the calculations yield conservative estimates.

The calibration described in pages 8 and 9 and in Appendix H was done entirely in the transient mode. The results are therefore probably sensitive to the specific yield assumed for the surficial aquifer. I found no mention of specific yield in the report or its appendices. I understand from the conference call that a uniform value of specific yield, 0.20, was used throughout the upper layer of the model. At a minimum, the report should give the value used, and present a rationale or justification, both for the use of a uniform value, and for the particular value that was chosen. I assume that the specific yield value was not determined through model calibration. If I'm correct in that assumption, we know that the calibrated hydraulic conductivity distribution gives satisfactory results if a uniform specific yield of 0.20 is used; we don't know if that conductivity distribution would work given a different specific yield or specific yield distribution.

During the conference call, the other reviewers mentioned the possibility of doing a steady-state calibration. I strongly endorse this idea, and note that it could do a great deal to resolve the specific yield issue. A hydraulic conductivity distribution based on steady-state calibration is independent of specific yield. If the conductivity distribution from a steady-state calibration turns out to be similar to that obtained in the transient calibration, the transient calibration can be taken both as confirmation of the hydraulic conductivity distribution, and as the basis (or at least one basis) for the specific yield value. I agree with Dr. Peralta that there is ample hydraulic information on which to base a steady-state calibration. In known swampy areas, for example, the calculated water table should be at land surface. It should never be above land surface, and in areas where the vegetation is known to require a certain root depth, the water table must be below that depth. General experience with excavations and the need for dewatering during construction can also provide information useful to a steady-state calibration. A further source of information might be known stream characteristics, e.g., whether a stream is gaining or losing within a particular reach.

In a steady-state calibration, the objective is generally to match a mean annual water level distribution, compatible with mean annual precipitation, or perhaps to match a seasonal mean water level distribution compatible with the average precipitation rate during that season. There will always be some uncertainty associated with the results; in many cases, however, it will turn out that the conductivity distributions which can give satisfactory results are limited to a relatively narrow range. While a steady-state calibration would do a great deal to resolve the specific yield question, I would recommend it whether or not specific yield were an issue, simply for the added confidence it would provide in the conductivity distribution. My sense from the conference call is that everyone was a little uneasy with the reliance on transient calibration

alone, and that confirmation through a steady-state calibration would give everyone a lot more confidence.

To return to the specific yield question, an alternative (or additional) approach would be to test the sensitivity of the calculated drawdowns at the fish farms to variation in specific yield, for the various scenarios assumed in the analysis. If the conclusions turn out to be the same regardless of the simulated specific yield distribution, and if that point is clearly brought out in the text, a strong rationale for a particular value would be unnecessary.

In general, one would expect drawdowns to spread more rapidly and widely the lower the specific yield, other factors remaining equal. The value that was used, 0.2, is not particularly high, especially for sandy materials and for periods of drainage measured in days or weeks. So an argument could certainly be made that this represents a conservative value. This argument could be further strengthened by noting that in swampy areas the specific yield may be much greater than 0.2, and may even approach unity. For example, if the surface of a swampy area is 50 percent soil having a specific yield of 0.3 and 50 percent open water, for which the specific yield is one, the weighted average specific yield would be 0.65. I'm not sure what fraction of the model area is represented by swamps, or what the percentage of open water within the swampy areas may be; but in any case, as I understand the simulations, these areas were not treated any differently from other parts of the aquifer. That is, they weren't represented as surface water bodies or as areas of high specific yield, or anything else. If they had been so represented, the calculated drawdowns at the fish farms would have been smaller. So if my interpretation of what was done is accurate, and if swampy areas make up a significant part of the study area, the use of a uniform specific yield value of 0.2 is highly conservative.

Another respect in which the model calculations are almost certainly conservative is in the use of a single model layer to represent the surficial aquifer. The text touches on this, but the issue merits much more emphasis. While this is primarily an editorial concern, rather than a technical issue, some technical points seem to have been neglected here: and again, no matter how valid the simulation results may be, the entire effort could be wasted if the analysis is not presented in a convincing manner in the report. In any case, because interaction between the surficial aquifer and deeper layers is apparently minimal, representation of the surficial aquifer as a single layer means that the analysis is essentially two-dimensional. For many (if not most) purposes this would be a limitation, but for estimation of the effects of lake drawdown on the fish ponds it represents a conservative approach. Saturated thicknesses are on the order of 100 feet in the surficial aquifer, and the lakes are represented as model boundaries. Thus unless something special was done along the boundaries, the lakes were simulated as fully penetrating the surficial aquifer, with no intervening resistance term. I'm not aware of actual depths or bottom conditions at the lakes, but it seems probable that they are partially penetrating, and that they are separated from the aquifer at least by a layer of typical organic lake bottom sediment. If this is the case, drawdowns in the aquifer adjacent to a lake would necessarily be less than the

lake drawdown. In the single-layer simulation, on the other hand, drawdowns in the aquifer adjacent to a lake would be virtually equal to the drawdown of the lake.

The single layer approach also eliminates any representation of vertical head loss within the aquifer itself. The effect of these head losses would be to reduce drawdowns at the fish ponds relative to those calculated in a single-layer simulation, although the magnitude of the reduction would vary depending on the flow field. The report does make the point that the ponds themselves are not represented as surface water bodies in the simulation, but rather are treated as parts of the aquifer; and that where hardpan is present beneath the ponds the actual pond drawdown will be less than that calculated for the aquifer. While I have no experience with fish farm ponds, I assume that they would tend to accumulate low-permeability organic bottom deposits, as happens in almost all non-flowing or slow-flowing surface water bodies. If this is the case, aquifer drawdowns calculated at the pond locations will overpredict actual pond drawdowns, whether or not hardpan is present. So in summary, I believe there are several reasons that two-dimensional simulations will tend to overpredict drawdown in the ponds, and I believe these reasons should be emphasized in the report.

*lake  
drawdown  
over  
predicted  
drawdown*

#### B. Editorial Comments -- Pages 1 through 10

Pg 2, third sentence -- the sentence says that land surface ranges in thickness from 20 feet to 270 feet; I believe the intent is to say that the surficial aquifer ranges in thickness from 20 feet to 270 feet.

Pg.2, Last paragraph - I suggest something like the following:

"Over the long term, the shallow aquifer system is at equilibrium -- i.e., average inflow to the aquifer is balanced by average outflow, and the water table at any given location tends to fluctuate about a mean position. Inflow consists primarily of recharge from infiltrating precipitation, while outflow occurs by seepage into lakes, streams and canals, by evapotranspiration, by downward leakage to the Floridan aquifer system, and by water use. On a short term basis, inflows and outflows are generally not in balance, and water alternately accumulates in the aquifer or drains from it, causing temporal fluctuation of the water table."

Pg 3, first paragraph - It would help to include some description of the areal extent of the fish ponds -- the size of a typical pond, the number of ponds at a typical fish farm, the density of areal coverage, or etc. The second sentence of the paragraph should read "They intersected the water table..." rather than "They intersected the top of the water table..."

Pg 3, fourth paragraph, second and third sentences - the paragraph would make more sense if the word "excess" were deleted, all three times that it appears.



Pg 4, first full paragraph - I recognize that this section is only reporting the results of an earlier study, but for the record, I fail to see the logic of the argument in the first two sentences of this paragraph. The idea seems to be that because the water table is higher at a point between Castelli Farms and the lake than it is at Castelli Farms -- i.e., that (apparently) a water table divide exists between Castelli Farms and the lake -- it follows that a change in water level at the lake can have no impact at Castelli Farms. But the presence of an intervening water table divide would not in itself preclude a water level change at Castelli Farms in response to a change in the level of Alligator Lake. Hydrogeologic stresses can and do propagate across water table divides, and need not eliminate the divide when they do so. If water levels on the divide are drawn down by a stress, water levels across the divide will be drawn down as well. I doubt that the water level at Castelli Farms (well OSS68) was actually influenced by Alligator Lake, but that doesn't make me feel any better about the argument made in this paragraph. It seems to me that the logical way to address the matter at issue using the water level records would be to attempt a correlation between the level of Alligator Lake and the level in well OSS68. If the results turned out to be negative, the case would be made.

Pgs 4 and 5 - general comment - The discussion on pages 4 and 5 seems to alternate between two issues -- the distance from Alligator Lake to which lake drawdown impacts might extend, and the effect which a severe drought could have on the fish farms. The first two sentences in the first full paragraph on page 4 deal with the areal extent of drawdown impacts. The third sentence deals with the possible impact of drought on the fish farms. The discussion through the rest of Page 4 also seems to be related primarily to the issue of drought impact. At the top of page 5, the discussion returns to the question of the distance to which drawdown impacts would extend; in the middle of page 5 it goes back to drought effects, and then in the last paragraph back to drawdown impacts. The discussion would be a lot easier to follow if it were reorganized, preferably under subheadings, so that the two subjects were considered separately.

Pg. 8 top -- The statement that the model "allows for three-dimensional flow in the surficial aquifer system, which was modeled as a single layer" will act as a lightning rod for negative comment from readers with an interest in criticizing the work. The MIKE SHE code indeed allows for three-dimensional flow simulation, but that capability was not applied to the surficial aquifer in this study -- it takes more than a single layer to represent three-dimensional flow. Actually, as discussed above, simulation of the surficial aquifer as a single layer is conservative for the purposes of this investigation; this is the point which should be emphasized, not the three-dimensional capabilities of the MIKE SHE code.

Page 8 - second paragraph - In general, slug tests are of limited reliability in materials of high permeability. The surficial aquifer seems to be generally high in permeability, and it's not surprising that the final calibrated values of hydraulic conductivity exceed the slug test estimates by an order of magnitude or more. But given this difference, is there any point in bringing up the slug tests or their results at all? The same final calibrated conductivities would

presumably have been obtained if arbitrarily chosen initial conductivity values had been used. Including the slug test results does not add to the credibility of the final conductivity values, and may actually provide ammunition for unwarranted criticism of the study. If the slug test discussion must be included, it would help to point out that reliability drops off at high conductivities, and that the calibration exercise subsequently confirmed the prevalence of high conductivity materials in the study area.

Pgs 9-10 and, Figures 4 and 5 - The conclusion on page 10 is that the two hydrographs illustrate that no impacts were measured at any of the wells due to the aquifer tests. I'm sure this conclusion will be disputed when the report is released. Figure 4 does indeed show short term fluctuations in the Beekman well, presumably in response to precipitation or other stress, but these fluctuations are superimposed on a general decline in water level which appears to correlate well with the drop in lake level. The fact that the short term fluctuations are not apparent in the lake record doesn't mean a great deal. Many kinds of stress would be expected to produce much greater impacts on ground water levels than on surface water, since surface water bodies have high storage factors, and in general much higher rates of outflow in response to a small increase in water level. Figure 5 shows a long term, almost linear decline in the water level of the Chestnut Well following the stepwise reduction in lake level. The text makes the point that the water level in the well continues to decline while Lake Gentry remains at a constant level. But in fact this is the response one would expect to a stepwise head change along an aquifer boundary. Water levels within the aquifer should continue to decline while the boundary head remains at its new level, until such time as the aquifer has come to equilibrium with the new boundary condition. The Chestnut well is located between two boundaries, both of which were subjected to stepwise head change. One would therefore expect to see a superimposed effect of both boundary changes, which again should persist while the new lake levels remain constant. It is true that there are obviously other factors influencing the Chestnut well. The slope of the hydrograph following the lake drawdown is about the same as its slope during periods of decline prior to the lake drawdown. This suggests that the lake drawdown is not primarily responsible for the later period of water level decline, and rather that the hydrograph is simply showing the normal recession of water level after a peak due to recharge. But the text does not make this argument, nor, in any case, does the similarity of the hydrograph slopes totally preclude the change in lake level as a contributing factor to the water level decline.

**C. Answers to Questions Posed in the Scope of Work**

**1. Have the ground water/surface water relations been reasonably characterized?**

Yes, for the purposes of this investigation. If the model is to be used for other purposes, it may be necessary, or at least advisable, to provide for simulation of swamp lands as discrete features of the model. This could be done, for example, by using a separate model layer to represent the upper few feet of the saturated zone, and by using very high specific yield and hydraulic conductivity values in that layer within the swampy areas. Alternatively, it should be possible to use the surface water components of the MIKE SHE code to represent swamplands (although I am not sufficiently familiar with the code to be sure that this is feasible).

**2. Is the MIKE SHE model an appropriate tool for analyzing ground water/surface water interactions?**

Yes, insofar as I can tell from the documentation. I have not used the code myself, nor did I have an opportunity to test the software during this review.

**3. Is the methodology and approach used in this assessment sound?**

Yes, except for the concerns noted in the discussion in Section A. Specifically, a steady-state calibration should be implemented, both for general confirmation of the hydraulic conductivity distribution obtained in transient calibration, and as one approach to the specific yield question. A sensitivity analysis, in which the sensitivity of the report's conclusions to variation in specific yield, should also be implemented. If the model is to be used for other purposes in the future, it may be necessary to use three-dimensional simulation of the surficial aquifer and to represent the swamps as discrete hydrologic features; but for the purposes of this analysis the procedures followed appear to be conservative.

**4. Has the method been appropriately applied?**

Yes, in general, but see the comments in response to question 3, above, and in Section A.

**5. Is the data collection network in proper locations, and is the data sufficient for analysis?**

Yes, at least for the purposes of this investigation. However, I believe there is more data available, beyond that provided through the network, and that this additional data could be used as the basis for a steady-state calibration. Examples would include water levels in excavations, flow characteristics of drains or small streams, crop types and their required root depths, and so on.

**6. Are the conclusions reached reasonable, i.e., accurate and supported by the analysis?**

Yes, subject to the qualifications in the discussion of Section A. The approach used, i.e., simulating the various scenarios with and without lake drawdown, is certainly valid, and the results are as good as the model that was used. The credibility of the model, in my mind and (I believe) in that of any reviewer or critic, would be reinforced if a steady-state calibration were implemented, if the sensitivity of the conclusions to variation in specific yield were tested, and if the report were strengthened by emphasizing those aspects of the calculation which can be considered conservative for the purposes of this study.

**7. (a) Has the project taken advantage of available ground water/surface water interaction assessment techniques and methodologies?**

Yes, to the extent required for purposes of the analysis. If the model developed in this project is to be used for purposes other than those of this investigation, additional techniques or methodologies, for example those discussed in the response to question 1 above, might be necessary.

**7. (b) Suggestions for future improvements of assessments and design of data collection systems.**

In general, an aquifer as thick and complex as the surficial aquifer should be represented using multiple model layers, to provide three-dimensional representation of the flow regime within the aquifer. For the purposes of the present study, use of a single layer is conservative, but this would not be true for most applications.

As a general principle, steady-state calibration, however approximate, should be implemented whenever a flow model is developed.

If a critical hydraulic parameter is specified arbitrarily in development of a model, the sensitivity of the conclusions of the study to variation in that parameter should be tested.

Data collection systems should, to the extent possible, address long term or average flow rates, as well as water levels. Even if the objectives are of a very general nature -- for example, characterizing certain stream reaches as perennially gaining or perennially losing, or setting limits on the flow rate into a drain -- the resulting data can be useful. Any information which can be developed on flows between the ground water and surface water regimes can reduce the uncertainties in a steady-state calibration.

The next item does not relate to data collection networks, but is certainly a data collection issue. In general, constant rate discharge or injection tests are much more reliable than slug tests